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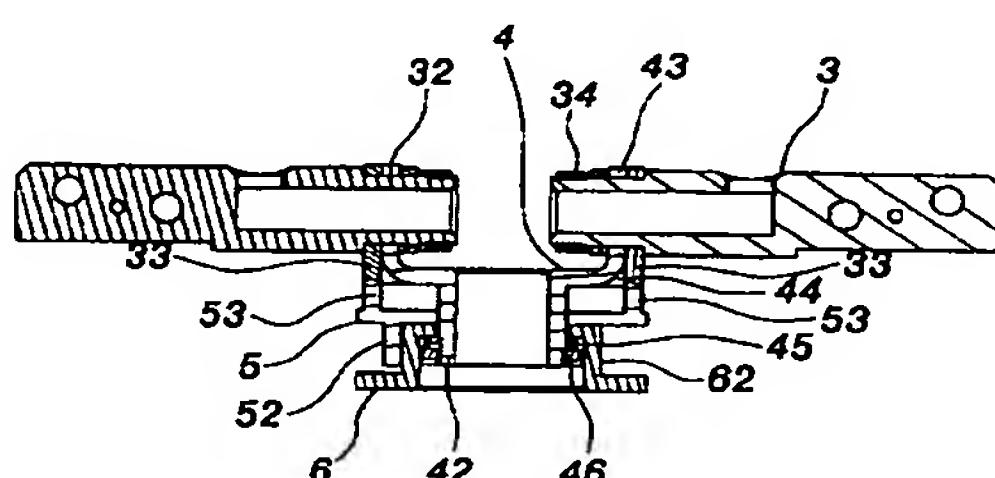
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[54] 实用新型名称 便携式计算机的显示部的转轴机构

[57] 摘要

一种便携式计算机的显示部的转轴机构，特别是指一种显示部被掀开的同时也能够相对撑高该显示部，避免该显示部的旋转会接触摩擦到座部表面，且盖合时又能达到密合的转轴机构。该转轴机构包括垂直轴及设置有偏心凸体的水平轴；该垂直轴包括：一设有对称凸耳及一柱体的第一构件，该对称凸耳穿接前述的水平轴；一套接于前述柱体的第二构件，其设有对应于前述偏心凸体的凸壁，且该第一、二构件间彼此干涉成能够同步旋转；及一套接于前述柱体的第三构件，该柱体下部与该第三构件的底面间设有弹性元件。本实用新型可避免其显示部在旋转时会刮及座部表面，也可避免其显示部与座部在盖合后会无法密合存在间隙的缺点。



1、一种便携式计算机的显示部的转轴机构，该转轴机构设置于便携式计算机的显示部与座部之间，该转轴机构包括垂直轴及设置有偏心凸体的水平轴，其特征在于，该垂直轴包括：

- 5 一第一构件，其设有对称凸耳及一柱体，该对凸耳还穿接有所述的水平轴；
- 一第二构件，套接于前述柱体，且设有对应于前述偏心凸体的凸壁，另外该第一、二构件间彼此干涉成能够同步旋转；及
- 10 一第三构件，套接于前述柱体，且该柱体下部与该第三构件的底面间还设有弹性元件。

2、如权利要求1所述的便携式计算机的显示部的转轴机构，其特征在于，所述的偏心凸体套固于该水平轴，该第一构件的各凸耳被夹持于该偏心凸体与一螺帽式固定元件之间，且该固定元件螺接于该水平轴。

3、如权利要求1所述的便携式计算机的显示部的转轴机构，其特征在于，
15 所述的第一构件的该对凸耳各穿接一水平轴，该对水平轴还各设有偏心凸体。

4、如权利要求3所述的便携式计算机的显示部的转轴机构，其特征在于，所述的第一构件设置有对称的两缺口，所述的各凸壁伸入所述的各缺口内。

5、如权利要求1所述的便携式计算机的显示部的转轴机构，其特征在于，所述的第一构件设置有对应于所述凸壁的缺口，该凸壁则伸入该缺口内。

20 6、如权利要求1所述的便携式计算机的显示部的转轴机构，其特征在于，所述的第三构件设置有一罩体，该罩体上开设一套接有所述柱体的轴孔。

7、如权利要求6所述的便携式计算机的显示部的转轴机构，其特征在于，所述的弹性元件套接于该第一构件的柱体，该柱体下部螺接有一螺帽，该弹性元件弹性撑持于该罩体顶壁与该螺帽之间。

25 8、如权利要求6所述的便携式计算机的显示部的转轴机构，其特征在于，所述的罩体的局部周缘进一步设有凸缘，所述第二构件则设有一相邻于该罩体周缘的凸块。

9、如权利要求1所述的便携式计算机的显示部的转轴机构，其特征在于，所述的水平轴为中空且轴壁上开设有与该中空部分相通的孔体，另外，该垂直轴的各构件间也具有相通的轴孔，显示部与座部间的电缆线通过该轴孔穿连、
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相接。

10、如权利要求 1 所述的一种便携式计算机的显示部的转轴机构，其特征在于，该设有偏心凸体的水平轴为一对。

便携式计算机的显示部的转轴机构

5 技术领域

本实用新型涉及一种“便携式计算机的显示部的转轴机构”，特别是指一种显示部被掀开的同时也能够相对撑高该显示部，避免该显示部的旋转会接触摩擦到座部表面，且盖合时又能达到密合的转轴机构。

10 背景技术

针对具有显示部与座部的便携式计算机而言，目前已有相当多的已上市产品或已公开专利，特别是针对该便携式计算机的显示部，给予设计成可旋转的功能。

请参阅图 1 所示，该公知具有可旋转其显示部 1 的功能的转轴 12，大体上是利用可转动的水平轴来枢接于可转动的垂直轴，通过所述的水平轴来掀开该显示部 1，并通过所述的垂直轴旋转该显示部 1。另外，该公知的便携式计算机，其座部 2 设置有一提把 21，便于提供手提、携行该便携式计算机；而该显示部 1 设有一显示屏 11。

但是，使用了该公知转轴 12 的便携式计算机，由于该转轴 12 本身的稳定性较为不足，故当该显示部 1 被掀开并旋转后，其底边与该座部 2 表面间是会有如图 1 所示的接触摩擦处 22，而此一接触摩擦处 22 在该显示部 1 被旋转时，会顺势刮伤该座部 2 的表面、破坏对象的美观性，甚至会被该座部 2 表面的诸多键盘按键所卡到，造成刮伤、误触按键、以及旋转不顺等诸多缺点。

请参阅图 2 所示，为了防止如图 1 所示的缺点，目前已有技术人员特别将该转轴改良成加长型的转轴 13 以使显示部 1 的高度被提高，相对使其显示部 1 在掀开并旋转时不会有上述的情形；但是，如图 2 所示，该加长型的转轴 13 反而会在盖合后，造成该显示部 1 与座部 2 之间会有间隙 23 存在，而其盖合后仍有间隙 23、存在无法密合的缺点。因此，本实用新型人针对上述公知技术的缺点，提出一种设计合理且有效排除其缺点的本实用新型所述的便携式计算机的显示部的转轴机构。

实用新型内容

本实用新型“便携式计算机的显示部的转轴机构”的主要目的，在于能够同时有效的避免公知的两种缺点，第一是可避免其显示部在旋转时会刮及座部表面，第二是可避免其显示部与座部在盖合后无法密合而有间隙存在的缺点。

本实用新型的上述目的是这样实现的，一种便携式计算机的显示部的转轴机构，该转轴机构设置于便携式计算机的显示部与座部之间，该转轴机构包括垂直轴及设置有偏心凸体的水平轴。该垂直轴则包括：一设有对称凸耳及一柱体的第一构件，该对凸耳穿接有前述的水平轴；一套接于前述柱体的第二构件，其设有对应于前述偏心凸体的凸壁，且该第一、二构件之间是彼此干涉成能够同步旋转；及一套接于前述柱体的第三构件，该柱体下部与该第三构件的底面间设有弹性元件。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的偏心凸体套固于该水平轴，该第一构件的各凸耳被夹持于该偏心凸体与一螺帽式固定元件之间，且该固定元件螺接于该水平轴。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的第一构件的该对凸耳各穿接一水平轴，该对水平轴还各设有偏心凸体。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的第一构件设置有对称的两缺口，所述的各凸壁伸入所述的各缺口内。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的第一构件设置有对应于所述凸壁的缺口，该凸壁则伸入该缺口内。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的第三构件是设置有一罩体，该罩体上开设一套接有所述柱体的轴孔。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的弹性元件套接于该第一构件的柱体，该柱体下部螺接有一螺帽，该弹性元件是弹性撑持于该罩体顶壁与该螺帽之间。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的罩体的局部周缘进一步设有凸缘，所述第二构件则设有一相邻于该罩体周缘的凸块。

本实用新型所述的便携式计算机的显示部的转轴机构，其中，所述的水平

轴为中空且轴壁上开设有与该中空部分相通的孔体，另外，该垂直轴的各构件间也具有相通的轴孔，显示部与座部间的电缆线通过该轴孔穿连、相接。

本实用新型所述的一种便携式计算机的显示部的转轴机构，其中，该设有偏心凸体的水平轴为一对。

5 为使贵审查委员更进一步了解本实用新型的特征与技术内容，谨请参阅以下有关本实用新型的详细说明与所示附图，然而，所示附图仅供参考与说明用并非用来对本实用新型加以限制。

附图说明

10 图 1 是公知便携式计算机在掀开并旋转其显示部后的侧视图；

图 2 是公知便携式计算机在盖合时的侧视图；

图 3 是本实用新型转轴机构的立体分解图；

图 4 是本实用新型转轴机构的立体组合图；

图 5 是本实用新型转轴机构在动作前的剖面图；

15 图 5A 是本实用新型转轴机构在动作后的剖面图；

图 6 是本实用新型用于便携式计算机且为盖合时的侧视示意图；

图 7 是本实用新型依据图 6 掀开后的侧视示意图；

图 8 是本实用新型依据图 7 旋转九十度后的侧视示意图。

20 具体实施方式

请参阅图 3 至图 5 所示，本实用新型提供一种便携式计算机的显示部的转轴机构，该转轴机构包括一对水平轴 3 及一垂直轴，而该垂直轴则包括了如图 3 所示的第一构件 4、第二构件 5 以及第三构件 6。其中，该水平轴提供便携式计算机显示部掀开、盖合，而垂直轴则供该显示部在掀开后进行旋转。

25 该水平轴 3 的一端部，凸伸有一小径部 32，该小径部 32 并凸出或固设有一偏心凸体 33，所述固设是包括如图所示在套接后再予以焊固、粘固或卡固等固设方式，故当该水平轴 3 转动时能同步带动其偏心凸体 33 转动，若以该水平轴 3 为轴而转动时，其上的偏心凸轮型式的偏心凸体 33 能被同步带动且偏心旋转；另外，该水平轴设置有一孔体 31，该孔体 31 是与该水平轴 3 的中空内部相通，以便供电缆线穿入该水平轴 3 内。

该第一构件 4 对称设有一对凸耳 43，该对凸耳 43 各具穿孔，且对应于各个凸耳 43 之处各设有一缺口 44。该第一构件 4 的轴心处设置一轴孔 41，自该轴孔 41 朝下延伸出一做为轴接用的柱体 42，该中空柱体 42 的下部外缘设有螺纹。

5 该第二构件 5 对称设有一对凸壁 53，且具有可供前述柱体 42 穿套的轴孔 51，另外，该第二构件 5 的底面设有一凸块 52。

该第三构件 6 设有一罩体 62，该罩体 62 顶面设置有一供前述柱体 42 穿套的轴孔 61，且该罩体 62 的局部周缘形成有一凸缘 63。另外，该第三构件 6 设有多数螺孔 64，用于固设在便携式计算机的座部。

10 各部件之间的联结关系请参阅图 3、图 4 所示，该对水平轴 3 的各个小径部 32 穿设于该第一构件的对称凸耳 43，各小径部 32 的自由端各螺接有一固定元件 34，使得该凸耳 43 夹持于该固定元件 34 与该水平轴上的偏心凸体 33 间，且通过控制该固定元件 34 的螺合紧度，可以控制各凸耳 43 及盘形弹簧 35 被夹持的紧度，相对使该对水平轴 3 的转动也具相应的紧度，因此，该对水平轴 3 虽各轴接于第一构件的该对凸耳 43，却仍能够以具有紧度的方式转动，以便以该水平轴 3 为轴而同步带动其上的偏心凸体 33 偏心旋转。至于该对水平轴 3 的各另端，即两水平轴的相对外端，则供固设于便携式计算机的显示部（详如后述），使该显示部的掀开或盖合以该对水平轴 3 为轴来动作。

该第一构件 4 的柱体 42，是穿套于该第二构件 5 及第三构件 6 的轴孔 51、
20 61 内，使该三个构件彼此上下叠接在一起，并且由于是圆形柱体 42 与圆形轴孔 51、61，故能以该柱体 42 为轴供第一构件 4、第二构件 5 旋转，并且能够通过该柱体 42 供该第一构件 4 上下活动。其中，该第二构件 5 的该对凸壁 53 是如图 4 所示伸入于该第一构件 4 的相应缺口 44 内而彼此干涉，使该第一构件 4 的旋转也能同步带动该第二构件 5 旋转；再者，该第二构件 5 的该对凸壁 25 53 恰好分别与该对水平轴 3 的各偏心凸体 33 相互对应，如图 5 所示的未顶抵状态，以便在以水平轴 3 为轴而转动并同步带动其偏心凸体 33 偏心旋转，即同向偏转后，如图 5A 所示，恰好可使该偏心凸体 33 偏转至抵顶于各凸壁 53 上缘，并相对撑高该第一构件 4；另外，该第二构件 5 的凸块 52 恰好相邻于第三构件的罩体 62 周缘、并受限于所述凸缘 63，使该第二构件 5 的旋转受到 30 第三构件的凸缘 63 限制。

该第一构件 4 的柱体 42 下部螺接有一螺帽 46，也可直接在柱体 42 下部一体形成有一圈图中未示的凸环，且螺帽与凸环的功效，用途相等，在该柱体 42 套设有一弹性元件 45，该弹性元件 45 弹性撑持于所述罩体 62 顶壁与所述螺帽 46（或所述凸环）之间，请参阅图 5 及图 5A 所示，使该第一构件 4 通过其柱体 42 进行上下活动，并具有弹力作用于其间，即当该第一构件 4 尚未被撑高时，该弹性元件 45 为伸张状态（如图 5），而当该第一构件 4 被撑高而向上活动时，该弹性元件 45 是相应同步收缩而产生反制其向上活动的弹性回复力。

下面配合一便携式计算机的动作说明。请参阅图 6 所示，该便携式计算机 7 是由一显示部 71 及一可被该显示部所盖合的座部 72 彼此借由一转轴机构所接设而成，且本实用新型转轴机构在未动作之前，所述的各偏心凸体 33 均如图 4、图 6 所示朝向该转轴机构的背后方向，为一尚未动作的状态。请参阅图 6 所示，本实用新型转轴机构实施该便携式计算机 7，主要是将其垂直轴中的第三构件 6 借由如图 3 所示的螺孔 64 而螺固于该座部 72 内，而转轴机构中的该对水平轴 3 则如图六、图八所示固接（此为公知技术，不再赘述）于显示部 71 内，因此使该转轴机构连接于显示部 71 与座部 72 之间。

请参阅图 6 所示，盖合状态时的该便携式计算机 7，其转轴机构中的偏心凸体 33 恰是朝向该显示部 71 的底边方向，故在盖合状态时该偏心凸体 33 尚未作用于相对应的各该凸壁 53，而尚未撑高其显示部 71。

请参阅图 7 并搭配参阅图 5 及图 5A 所示，当使用者掀开该显示部 71 时，能够带动该对水平轴 3 同步转动，而转动当中的该对水平轴 3 能够同时带动其偏心凸体 33 同向偏转；由于各偏心凸体 33 下方恰好各具有相对应的凸壁 53，故当该显示部 71 如图 7 所示被掀开至九十度时，原本朝后的各偏心凸体 33，顺势偏转而抵顶于所述的各凸壁 53 上缘，并因此而相对撑高该第一构件 4、接设于该第一构件 4 的该对水平轴 3、以及固接于该对水平轴 3 的该显示部 71，此时所述的弹性元件 45 被相应上移的螺帽 46 所压迫，而弹性收缩成如图 5A 所示的状态。借此，当使用者掀开该显示部 71 时，如图 7 所示，即能同步撑高该显示部 71，使该掀开后的显示部 71 底边与座部 72 表面间的距离加大，且该撑高由于所述弹性元件 45 本身的弹性回复力而非为松动状态，所以，掀开该显示部 71 而被撑高后，该显示部 71 与座部 72 间不会呈现松垮的状态。

请参阅图 8 所示，通过掀开的同时能够相对撑高显示部 71、使显示部 71 与座部 72 间的距离可于掀开的同时被加大的特殊作用，使得如图 8 般旋转该显示部 71 时，能够因此而具有绝不会与该座部 72 表面接触摩擦的功效，若以附图来表示则请参阅图 8，该显示部 71 的底边与座部 72 的表面之间具有被撑高后所形成的撑高间距 73，故该显示部 71 的底边绝不会接触摩擦到座部 72 的表面。

至于该显示部 71 的旋转，请参阅图 4，图 5 所示，由于所述第二构件 5、第三构件 6 的轴孔 51、61，均被该第一构件的柱体 42 所穿套，且第一构件 4、第二构件 5 间又各自利用其缺口 44 及凸壁 53 而彼此干涉，故当该显示部 71 被掀开、且该第一构件 4 被带动旋转时，如图 5A 所示，各偏心凸体 33 及各凸壁 53 同时干涉于相应缺口 44 内，故能够借此而同步带动该第二构件 5 旋转，而达到所述垂直轴的旋转幅度。再者，该垂直轴的旋转幅度，因为第二构件的凸块 52 与第三构件的凸缘 63 间的限制关系，能够限制该垂直轴的旋转幅度，相对能够避免电缆线会因过度旋转而绞断。

上述显示部 71 与座部 72 间电缆线（图未示）的穿设，如图 3、图 8 所示来说明，所述电缆线是先自该水平轴孔体 31 穿入该水平轴 3 的中空部分，再自该水平轴的小径部 32 端部伸出，并转而伸入该垂直轴的各重叠轴孔 41、51、61 内，以在该座部 72 内电性连接。

如上述的本实用新型结构，由于在掀开显示部的同时，可以相对撑高该显示部 71，使该显示部 71 底边与座部 72 表面间的距离被加大，进而在旋转该显示部 71 时能够具有绝不会接触摩擦到该座部 72 表面的功效，也绝不会刮伤该座部 72。更不会被该座部 72 表面的诸多键盘按键所卡到，且在旋转该显示部 71 时也绝不会有转动不顺的情况发生。反言之，当该显示部 71 被反向盖合时，所述的各偏心凸体 33 不再撑持于该水平轴 3 与凸壁 53 之间而未被撑高，故其盖合状态也能达到所要求的密合程度，即可达到：掀开旋转时所需的撑高要求及盖合时所需的密合要求。

综上所陈，本实用新型所提供的一种便携式计算机的显示部的转轴机构，的确可以解决公知在掀开旋转时易于接触摩擦到座部、或在盖合时无法密合其显示部与座部的缺点，属于一具有高度实用价值的实用新型产品。

但是，以上所述，仅是本实用新型的一较佳可行的实施例而已，并非局限

本实用新型的权利范围，举凡运用本实用新型说明书及附图内容所为的等效结构变化，均涵盖在本实用新型所要保护的权利要求范围内，舒予陈明。

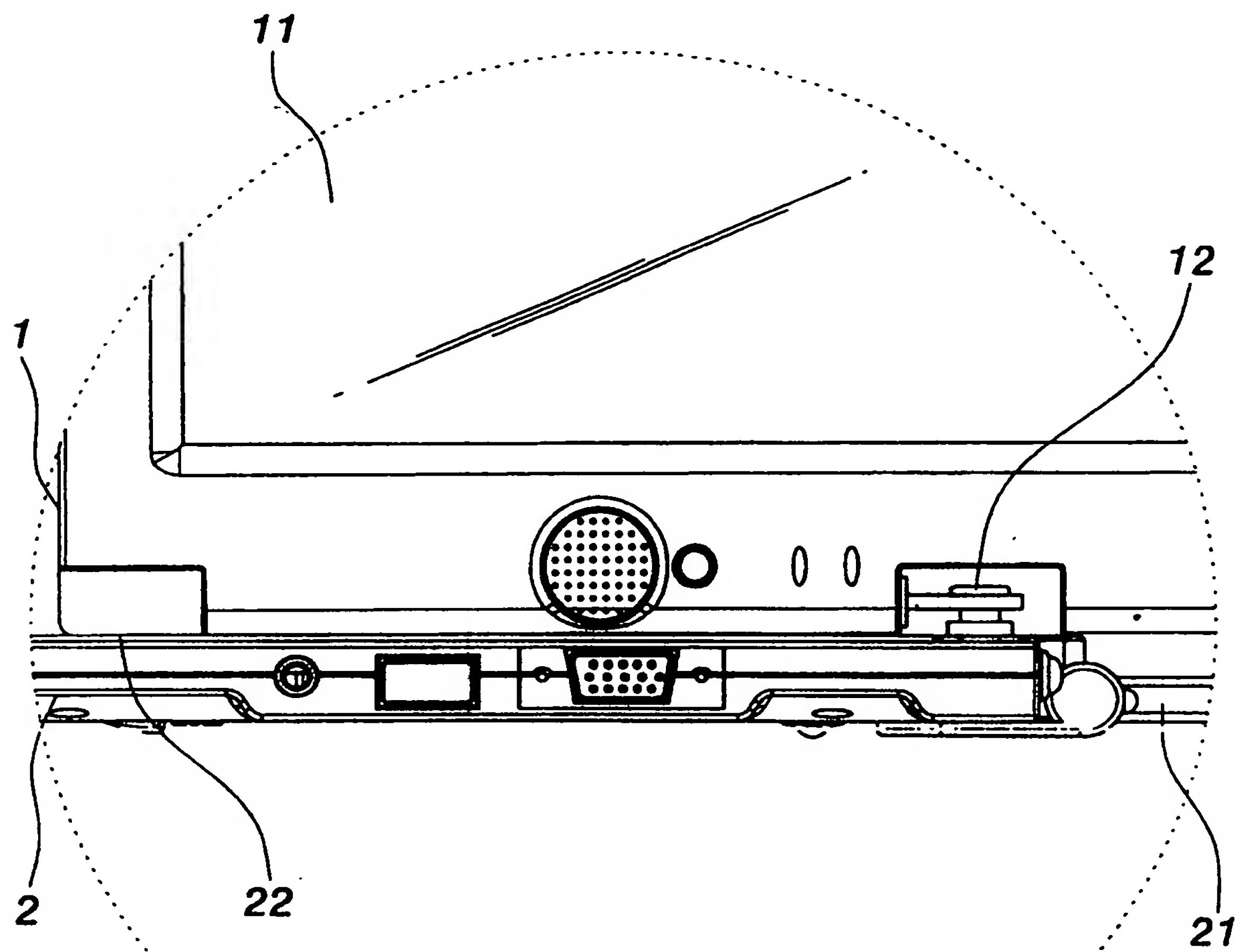


图 1

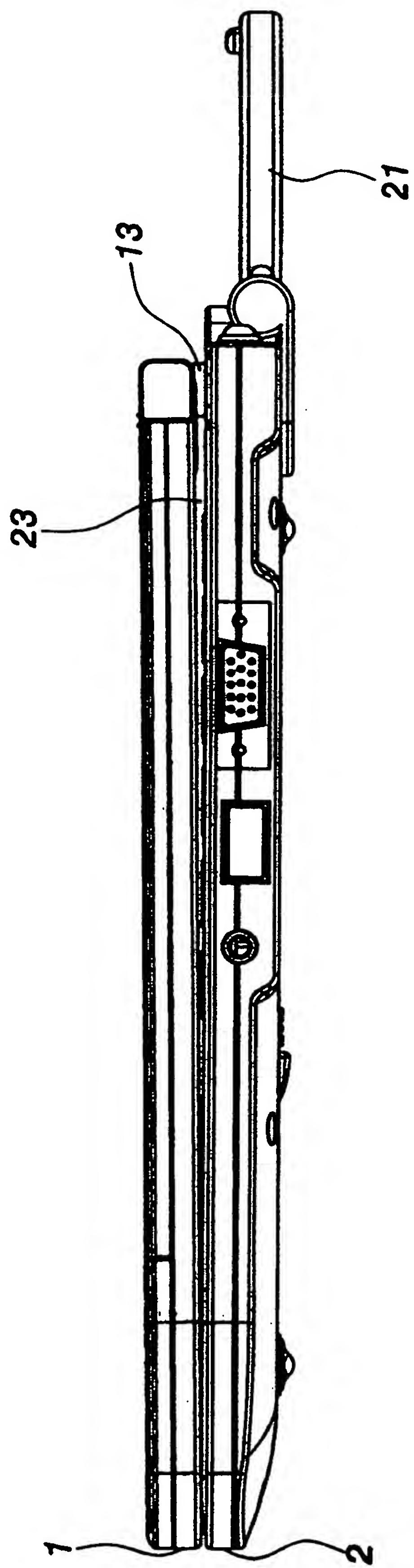


图 2

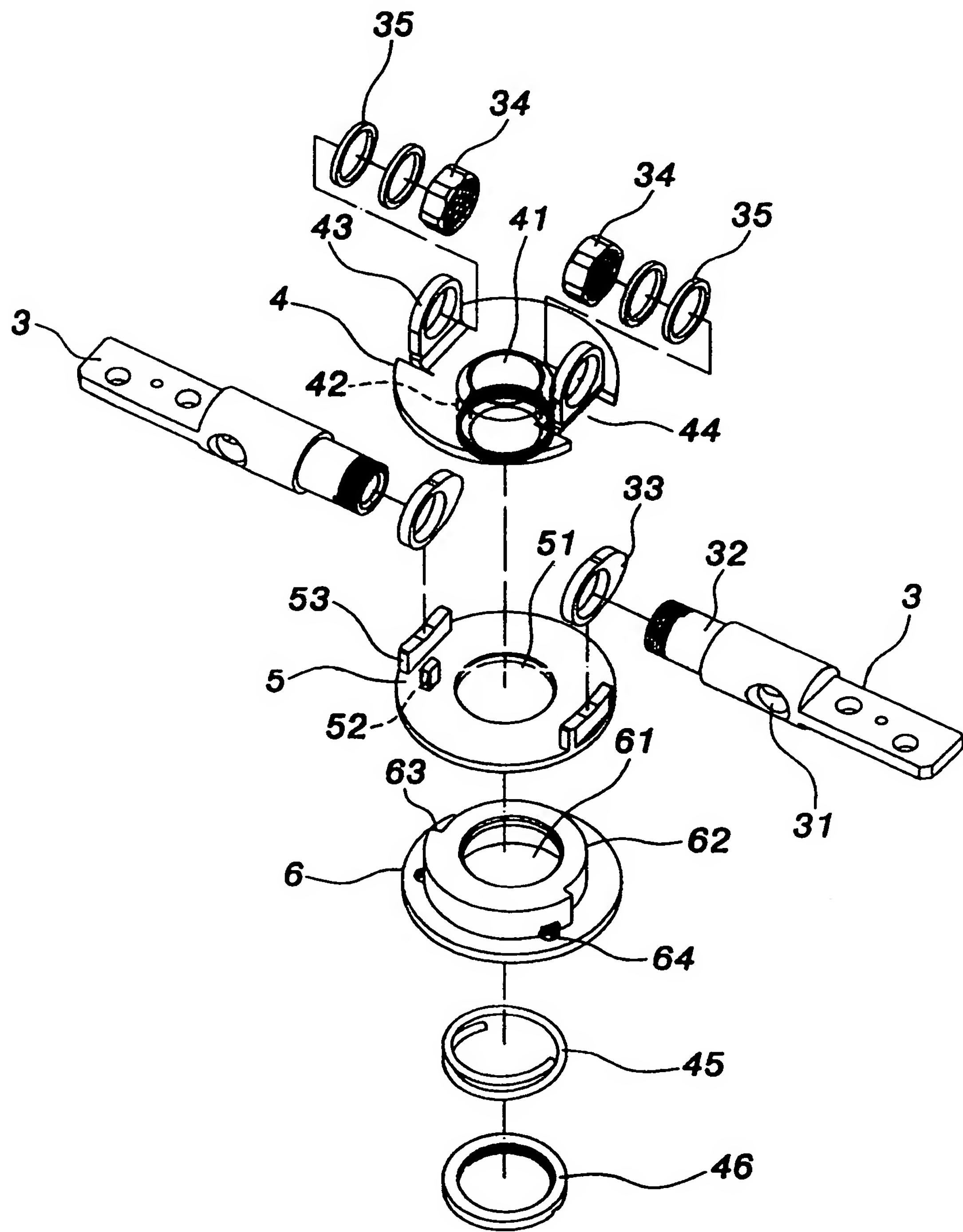


图 3

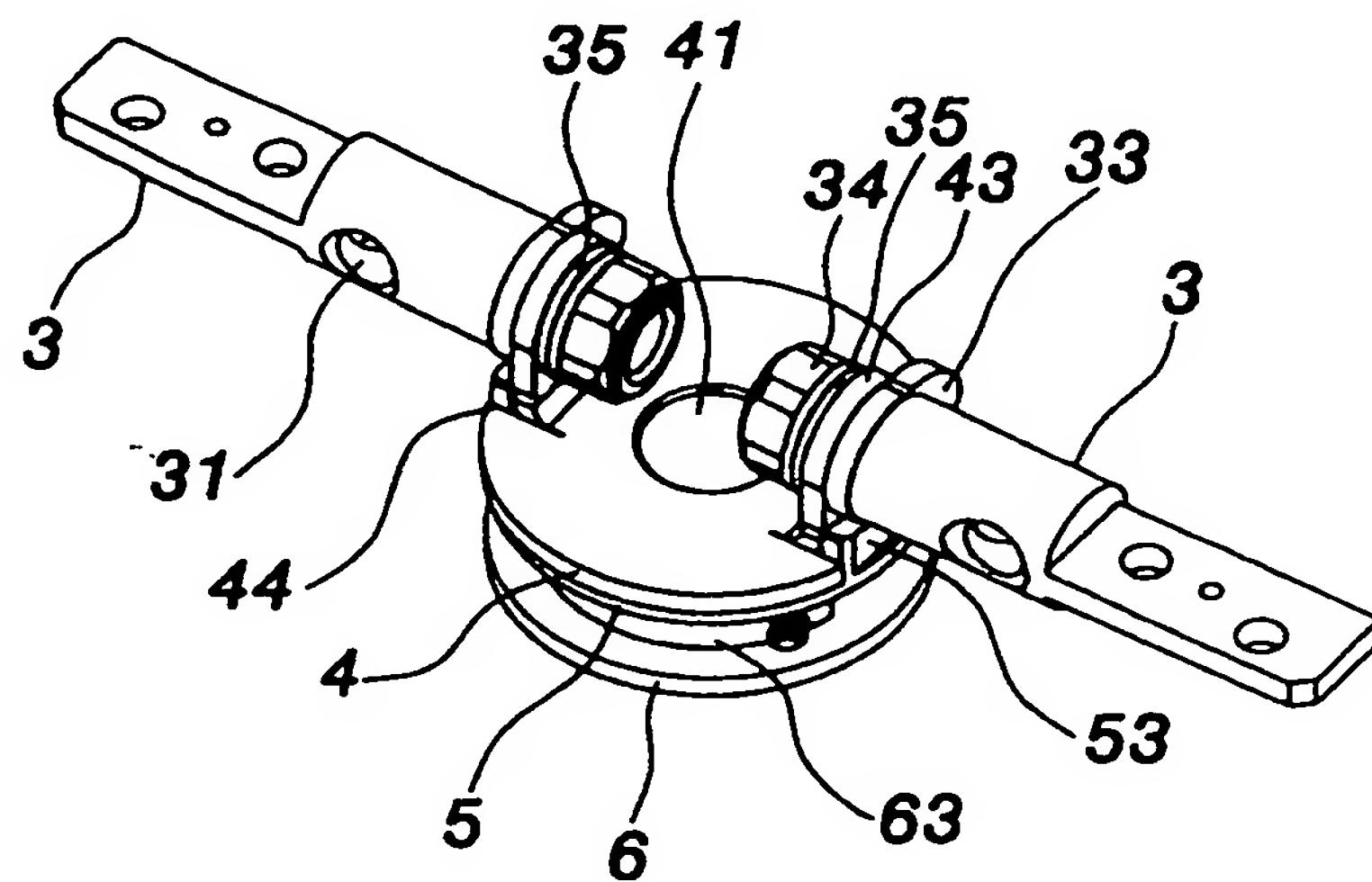


图 4

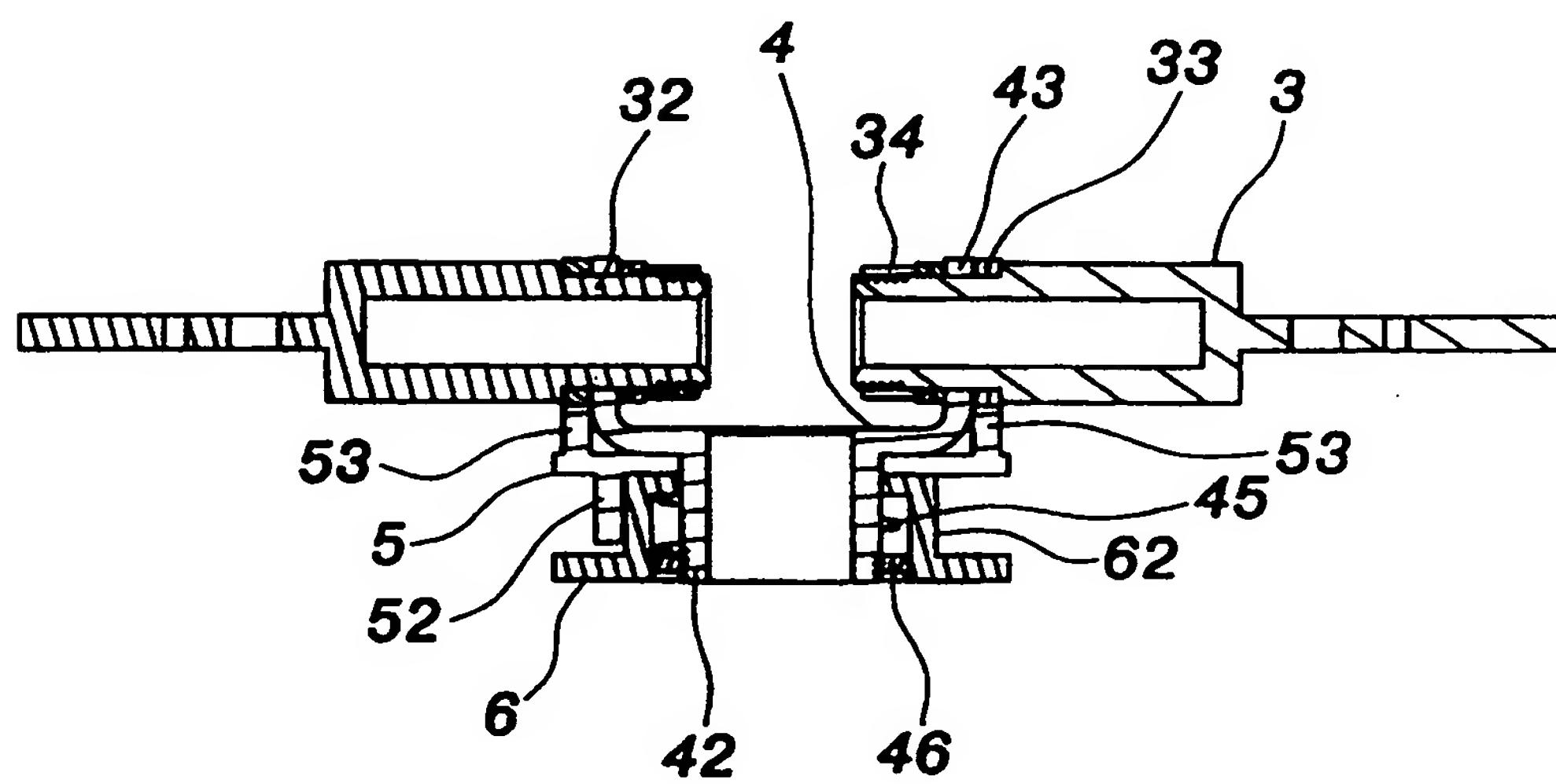


图 5

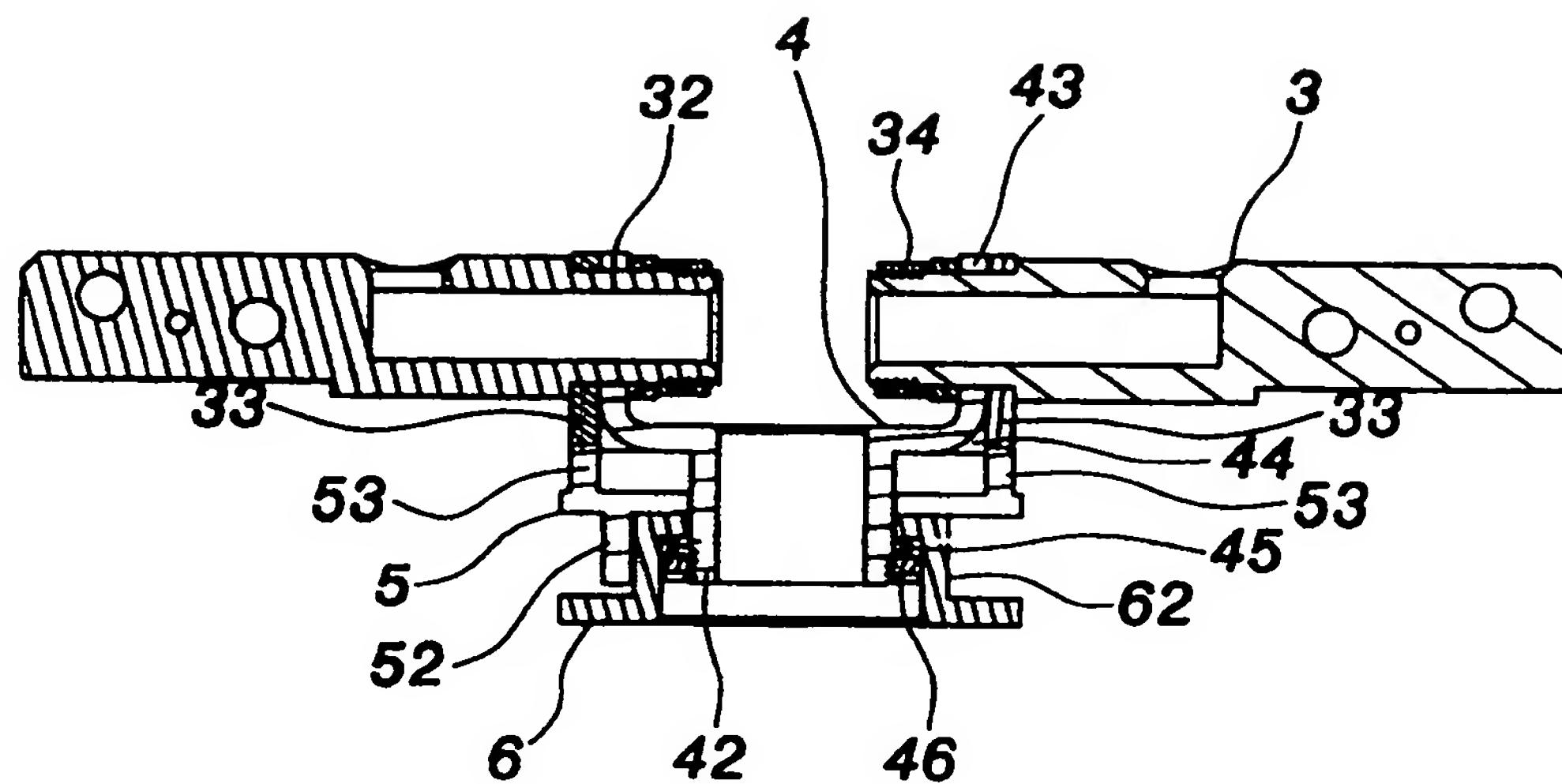


图 5A

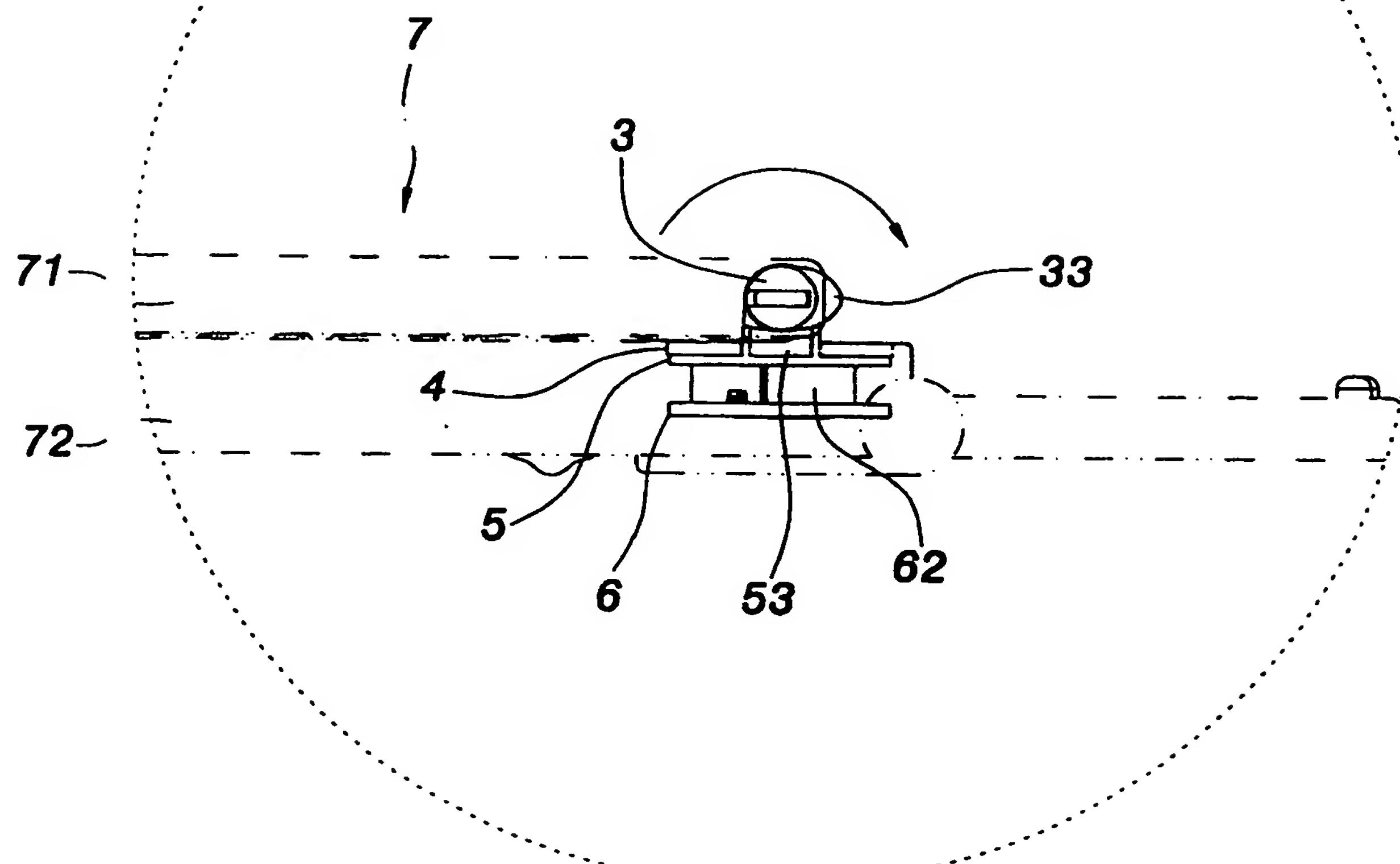


图 6

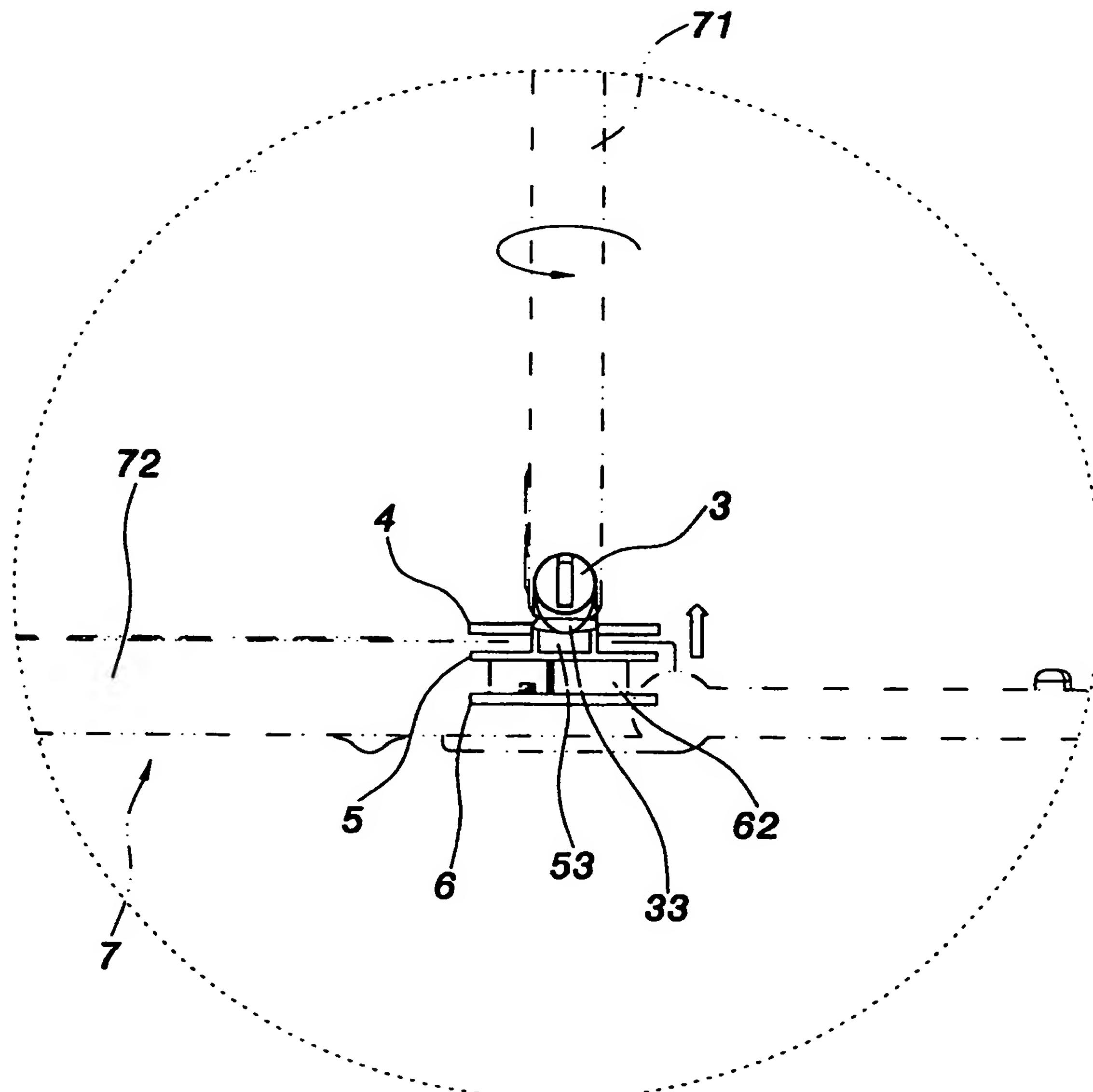


图 7

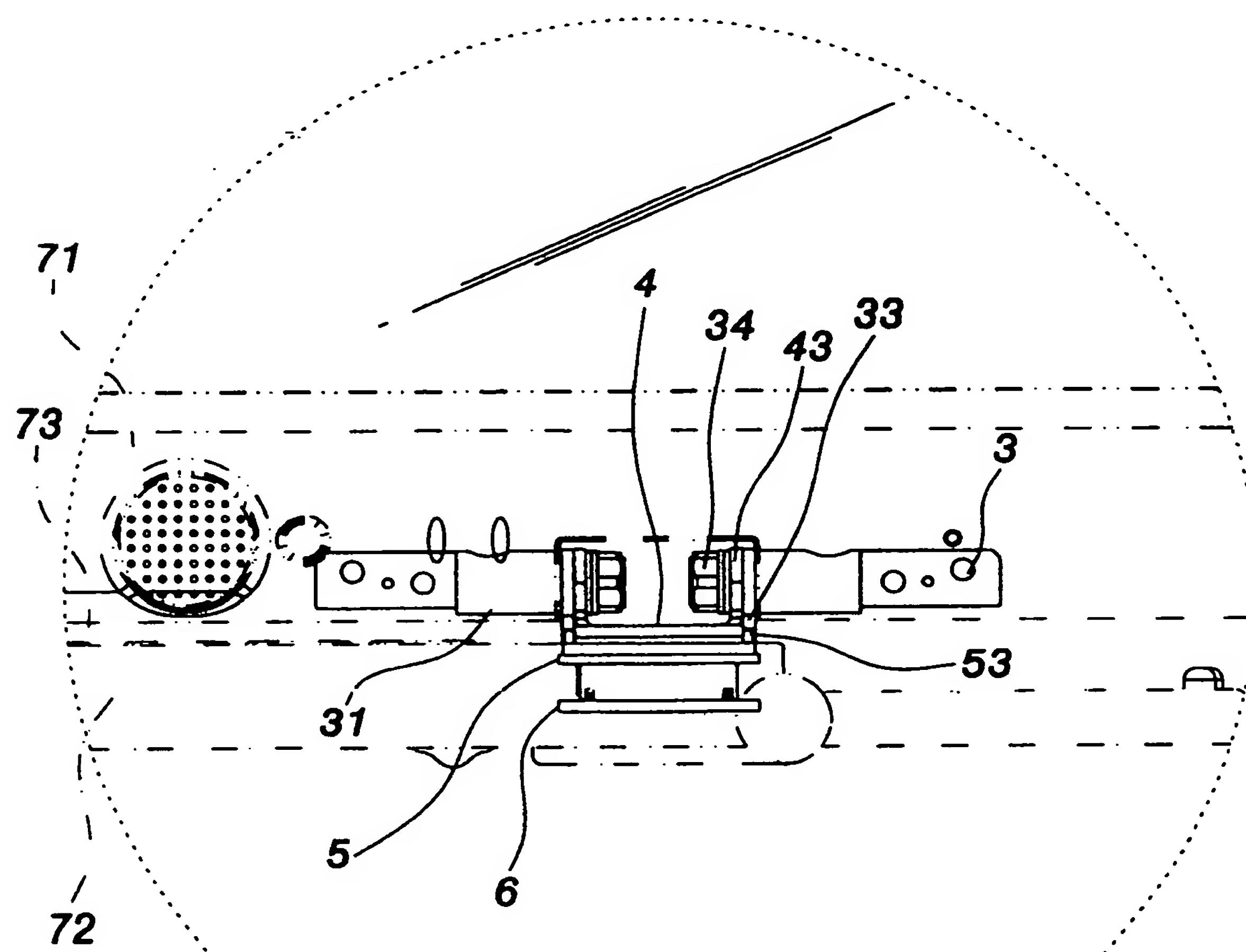


图 8

#Title:
Portable computer
#PublicationNumber:
CN1452040
#PublicationDate:
2003-10-29
#Inventor:
PIL-GYO CHOE (KR)
#Applicant:
SAMSUNG ELECTRONICS CO LTD (KR)
#RequestedPatent:
CN1452040
#ApplicationNumber:
CN20020128286; 2002-08-08
#PriorityNumber:
KR20020020134; 2002-04-12
#IPC:
G06F1/16; G06F1/16; G06F1/16
#IPC7:
G06F1/16
#ICM:
G06F1/16
#ICS:
G06F1/16
#NCL:
G06F1/16P2H; G06F1/16P2S3
#Abstract:

ATTENTION - DATA WAS TAKEN FROM US2003193773

A portable computer having a main body generating a video signal, and an LCD assembly receiving the video signal from the main body and displaying a picture. The computer further having a hinge part including a hollow swiveling part extending toward the main body, and a pair of tilting parts radially extended from the swiveling part and rotatably connecting the LCD assembly and the main body; a rotation supporting part provided on the main body and rotatably supporting the swiveling part of the hinge part; and a video signal transmission member having a first end connected to the main body and a second end connected to the LCD assembly while being accommodated inside of the swiveling part of the hinge part and the rotation supporting part, and transmitting the video signal from the main body to the LCD assembly. With this configuration, the portable computer is capable of tilting and swiveling an LCD assembly, has a simple tilting and swiveling structure because of hollow tilting and swiveling parts formed as a single body, has a compact cable accommodating structure, and is capable of firmly keeping the LCD assembly at a desired angle.

#Description:

ATTENTION - DATA WAS TAKEN FROM US2003193773

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Application No. 02-20134, filed Apr. 12, 2002, in the Korean Industrial Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The present invention relates in general to a portable computer, and more particularly, to a portable computer which has an LCD assembly capable of tilting and swiveling.

[0004] 2. Description of the Related Art

[0005] Generally, a portable computer comprises a main body including a main board mounted with a central processing unit, a graphic chip, etc., and an input unit, and an LCD (liquid crystal display) assembly displaying a picture based on input data.

[0006] The portable computer is used with its LCD assembly in an opened position. Oppositely, when the portable computer is not used or when the portable computer is carried, the portable computer is kept in a folded position. That is, in the

conventional portable computer, the LCD assembly is rotated up and down against the main body in a tilting movement.

[0007] Further, in the conventional portable computer, the LCD assembly can be rotated laterally against the main body in a swiveling movement. Therefore, it is not necessary to turn the whole portable computer laterally.

[0008] However, in the conventional portable computer, a tilting part and a swiveling part are independent of each other, and it is hard for the tilting and swiveling parts to accommodate an LCD-FPC (flexible printed circuit) cable or an optical cable which connects the main body with the LCD assembly and transmits a video signal from the main body to the LCD assembly. Therefore, it is not easy to assemble the portable computer.

[0009] Further, in the conventional portable computer, there is provided stoppers such as a projection in order to hold the LCD assembly at a predetermined swiveling-angle. However, the LCD assembly can be arbitrarily swiveled in a rotation section between the stoppers, so it is difficult to hold the LCD assembly firmly at a desired angle. Therefore, it is difficult to apply the swiveling unit to a portable computer employing a touch-screen system.

SUMMARY OF THE INVENTION

[0010] Accordingly, it is an object of the present invention to provide a portable computer which has a simple tilting and swiveling unit for an LCD assembly, and a compact cable accommodating structure, and is capable of firmly keeping the LCD assembly at a desired angle.

[0011] Additional objects and advantages of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

[0012] The above and other objects of the present invention may be accomplished by providing a portable computer having a main body generating a video signal, and an LCD assembly receiving the video signal from the main body and displaying a picture, comprising: a hinge part including a hollow swiveling part extended toward the main body, and a pair of tilting parts radially extending from the swiveling part and rotatably connecting the LCD assembly and the main body; a rotation supporting part provided in the main body and rotatably supporting the swiveling part of the hinge part; and a video signal transmission member having a first end connected to the main body and a second end connected to the LCD assembly while being accommodated inside of the swiveling part of the hinge part and the rotation supporting part, and transmitting the video signal from the main body to the LCD assembly.

[0013] In an aspect of the present invention, the rotation supporting part includes a hollow main part placed in a through hole formed on a rear upper surface of the main body; and a flange part radially extending from the lower part of the main part and combined to the back of the through hole.

[0014] In another aspect of the present invention, the video signal transmission member includes at least one of an LCD-FPC (flexible printed circuit) cable and an optical cable.

[0015] In yet another aspect of the present invention, the portable computer further comprises a friction member provided between the rotation supporting part and the swiveling part, and resisting swiveling of the LCD assembly. The friction member includes a hollow plate spring, and the video signal transmission member passes through the plate spring.

[0016] In yet another aspect of the present invention, the portable computer further comprises a breakaway-preventive member provided in the lower part of the rotation supporting part and combined to the lower part of the swiveling part so as to prevent the swiveling part of the hinge part from breaking away upwardly from the rotation supporting part, wherein the breakaway-preventive member has a ring shape and the video signal transmission member passes through the breakaway-preventive member.

[0017] In yet another aspect of the present invention, the LCD assembly comprises: an LCD panel receiving the video signal from the main body and displaying a picture thereon; a rear cover placed in the rear of the LCD panel; a hinge accommodating part provided in the lower front part of the rear cover, and rotatably accommodating the tilting part of the hinge part; a front cover connected to the rear cover with the LCD panel being located therebetween so as to support the LCD panel, and formed with a cut part corresponding to the hinge accommodating part in the lower front

part thereof; and a shield cover removably combined to the cut part, and covering the tilting part of the hinge part accommodated in the hinge accommodating part.

BRIEF DESCRIPTION OF THE DRAWINGS

- [0018] These and other objects and advantages of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:
- [0019] FIG. 1 is a perspective view of a portable computer according to an embodiment of the present invention, illustrating tilting of an LCD assembly thereof;
- [0020] FIG. 2 is a perspective view of the portable computer of FIG. 1, illustrating swiveling of the LCD assembly;
- [0021] FIG. 3 is a partially exploded perspective view of the portable computer of FIG. 1; and
- [0022] FIG. 4 is an enlarged section view of an assembled state of the portable computer of FIG. 3.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

- [0023] Reference will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout. The embodiments are described below in order to explain the present invention by referring to the figures.
- [0024] In a portable computer according to an embodiment of the present invention, an LCD assembly 20 is not only tilted (refer to FIG. 1) but also swiveled (refer to FIG. 2) against the main body 10.
- [0025] The portable computer according to the present invention, as illustrated in FIGS. 3 and 4, comprises the main body 10 generating a video signal, and the LCD assembly 20 receiving the video signal from the main body 10 and displaying a picture.
- [0026] The main body 10 includes a main board (not shown) mounted with a central processing unit, a graphic chip, etc., and an input unit 12 such as a keyboard, a mouse, etc. A video signal generated from data inputted by the input unit 12 is transmitted to the LCD assembly 20 through a video signal transmission member 30, and is displayed on an LCD panel 22.
- [0027] The video signal transmission member 30 includes at least one of an LCD-FPC (flexible printed circuit) cable and an optical cable. In order to prevent the video signal transmission member 30 from twisting due to tilting and swiveling of the LCD assembly 20, the video signal transmission member 30 from the main body 10 is connected to the LCD panel 22, being accommodated inside of a breakaway-preventive member 70, a friction member 60, a rotation supporting part 50, and a swiveling part 40b of a hinge part 40 (refer to FIG. 4).
- [0028] The LCD assembly 20 includes the LCD panel 22 displaying a picture thereon, and a front cover 26 and a rear cover 24 connected to each other with the LCD panel 22 being located therebetween and supporting the LCD panel 22.
- [0029] In the lower front part of the rear cover 24 a hinge accommodating part 24a partially accommodating a tilting part 40a of the hinge part 40 is provided, and in the lower front part of the front cover 26 a cut part 26a corresponding to the hinge accommodating part 24a is formed. Further, a shield cover 28, covering the tilting part 40a accommodated in the hinge accommodating part 24a, is removably connected to the cut part 26a.
- [0030] The hinge part 40 and the rotation supporting part 50 are provided between the LCD assembly 20 and the main body 10, to thereby support tilting and swiveling of the LCD assembly 20 against the main body 10.
- [0031] The hinge part 40 includes the hollow swiveling part 40b extending toward the main body 10, and the pair of tilting parts 40a extending radially from the swiveling part 40b and rotatably connected to the hinge accommodating part 24a of the rear cover 24.
- [0032] Herein, the tilting part 40a and the swiveling part 40b may be formed as a single body, thereby simplifying the tilting and swiveling structure.
- [0033] The rotation supporting part 50 includes a hollow main part 50a placed in a

through hole 10a formed on the rear upper surface of the main body 10 and accommodating the swiveling part 40b therein, and a flange part 50b radially extending from the lower part of the main part 50a and connected to the back of the through hole 10a by means of a screw 52.

[0034] Thus, the rotation supporting part 50 is inserted in the through hole 10a formed on the rear upper surface of the main body 10, and the hinge part 40 is connected to the LCD assembly 20. Thereafter, the swiveling part 40b of the hinge part 40 is inserted in the main part 50a of the rotation supporting part 50. Then, the LCD assembly 20 can be tilted by the pair of tilting parts 40a serving as a hinge, and can be swiveled by the swiveling part 40b inserted in the main part 50a.

[0035] On the other hand, if the LCD assembly 20 is arbitrarily swiveled against the main body 10, it is not handy for a user to swivel the LCD assembly 20, and it is difficult to hold the LCD assembly 20 at a desired angle. Accordingly, according to the present invention, there is provided the friction member 60 between the rotation supporting part 50 and the swiveling part 40b, which resists swiveling of the LCD assembly 20.

[0036] The friction member 60 includes a plate spring having a doughnut shape. However, the friction member 60 may include soft rubber, sponge, etc. Like the swiveling part 40b of the hinge part 40 and the main part 50a of the rotation supporting part 50, the friction member 60 should have a hollow shape to accommodate the video signal transmission member 30 therein. At this time, the plate spring has the modulus of elasticity enough to prevent the LCD assembly 20 from arbitrarily swiveling.

[0037] Further, there is provided the breakaway-preventive member 70 on the lower part of the rotation supporting member 50, which is connected to the lower part of the swiveling part 40b inserted in the main part 50a of the rotation supporting part 50 by a screw 72 and prevents the swiveling part 40b of the hinge part 40 breaking away upwardly from the main part 50a of the rotation supporting part 50. Herein, the breakaway-preventive member 70 has a ring shape, thereby allowing the video signal transmission member 30 to pass therethrough.

[0038] With this configuration, the portable computer according to the present invention is assembled as follows. First, the shield cover 28 is removed from the front cover 26, and the pair of tilting parts 40a is rotatably accommodated in the hinge accommodating part 24a of the rear cover 24, and then the shield cover 28 is connected to the cut part 26a of the front cover 26.

[0039] Thereafter, the main part 50a of the rotation supporting part 50 is inserted in the through hole 10a of the main body 10, and the flange part 50b, radially extending from the main part 50a, is connected to the back of the through hole 10a by the screw 52. After the hinge part 40 and the rotation supporting part 50 are connected to the LCD assembly 20 and the main body 10, respectively, the swiveling part 40b of the hinge part 40 combined to the LCD assembly 20 is inserted in the main part 50a of the rotation supporting part 50 connected to the main body 10. Thereafter, the friction member 60 is positioned on the lower part of the rotation supporting part 50, and then the breakaway-preventive member 70 is connected to the swiveling part 40b by the screw 72 across the rotation supporting part 50 and the friction member 60, thereby connecting the hinge part 40 and the rotation supporting part 50.

[0040] At this time, the video signal transmission member 30 connects the main body 10 and the LCD panel 22, while being accommodated inside of the breakaway-preventive member 70, the friction member 60, the main part 50a of the rotation supporting part 50, and the swiveling part 40b of the hinge part 40.

[0041] Accordingly, as the portable computer is completely assembled, tilting of the LCD assembly 20 is, as illustrated in FIG. 1, allowed by the pair of tilting parts 40a serving as a hinge, and swiveling of the LCD assembly 20 is, as illustrated in FIG. 2, allowed by the swiveling part 40b of the hinge part 40 inserted in the main part 50a of the rotation supporting part 50.

[0042] As described above, the present invention provides a portable computer capable of tilting and swiveling an LCD assembly, which has a simple tilting and swiveling structure provided by hollow tilting and swiveling parts formed as a single body, and a compact cable accommodating structure, and is capable of firmly keeping the LCD assembly at a desired angle.

[0043] Although a few embodiments of the present invention have been shown and described, it would be appreciated by those skilled in the art that changes may be

made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

#Claims:

ATTENTION - DATA WAS TAKEN FROM US2003193773

what is claimed is:

1. A portable computer having a main body generating a video signal, and an LCD assembly receiving the video signal from the main body and displaying a picture, comprising:
a hinge part including a hollow swiveling part extending toward the main body, and a pair of tilting parts radially extending from the swiveling part and rotatably connecting the LCD assembly and the main body;
a rotation supporting part provided on the main body and rotatably supporting the hollow swiveling part of the hinge part; and
a video signal transmission member having a first end connected to the main body and a second end connected to the LCD assembly while being accommodated inside of the swiveling part of the hinge part and the rotation supporting part, and transmitting the video signal from the main body to the LCD assembly.
2. The portable computer according to claim 1, wherein the rotation supporting part includes:
a hollow main part placed in a through hole formed on a rear upper surface of the main body; and
a flange part radially extending from the lower part of the main part and connected to the back of the through hole.
3. The portable computer according to claim 1, wherein the video signal transmission member includes at least one of an LCD-FPC (flexible printed circuit) cable and an optical cable.
4. The portable computer according to claim 1, further comprising a friction member provided between the rotation supporting part and the hollow swiveling part, and resisting swiveling of the LCD assembly.
5. The portable computer according to claim 4, wherein the friction member includes a hollow plate spring, and the video signal transmission member passes through the plate spring.
6. The portable computer according to claim 5, further comprising a breakaway-preventive member provided on the lower part of the rotation supporting part and connected to the lower part of the hollow swiveling part so as to prevent the swiveling part of the hinge part from breaking away from the rotation supporting part, wherein the breakaway-preventive member has a ring shape and the video signal transmission member passes through the breakaway-preventive member.
7. The portable computer according to claim 1, wherein the LCD assembly includes:
an LCD panel receiving the video signal from the main body and displaying a picture thereon;
a rear cover placed in the rear of the LCD panel;
a hinge accommodating part provided in a lower front part of the rear cover, and rotatably accommodating the tilting part of the hinge part;
a front cover connected to the rear cover with the LCD panel being located therebetween so as to support the LCD panel, and formed with a cut part corresponding to the hinge accommodating part in the lower front part thereof; and
a shield cover removably connected to the cut part, and covering the tilting part of the hinge part accommodated in the hinge accommodating part.
8. The portable computer according to claim 1, wherein the hinge part is positioned between said LCD assembly and said main body.
9. The portable computer according to claim 1, wherein the tilting part and the swiveling part are formed as a single body.

CN1452040A.txt

10. The portable computer according to claim 2, wherein the rotation supporting part is inserted in a through hole formed on a rear upper surface of the main body, and the hinge part is connected to the LCD assembly.

11. The portable computer according to claim 10, wherein the swiveling part of the hinge part is inserted in the hollow main part of the rotation supporting part.

12. The portable computer according to claim 5, wherein the friction member is formed of one of soft rubber and sponge having a modulus of elasticity enough to prevent the LCD from arbitrarily swiveling.

#Family:

CN1242310CC;2006-02-15;Portable computer

CN1452040A;2003-10-29;Portable computer

JP2003316474A;2003-11-07;PORTABLE COMPUTER

KR2003081761A;2003-10-22;PORTABLE COMPUTER

US6867961B2;2005-03-15;Portable computer

US2003193773A1;2003-10-16;Portable computer

#LegalStatus:

Legal status (INPADOC) of CN1452040 No legal data found.

#OPS Family Data:

Family Data of :"CN1452040A"

Family Member: PN="CN1242310C" PD="2006-02-15" AP="CN02128286A" PN_E="CN1242310C"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-10-29" PN="CN1452040" (B111EP)

Filed DATE="2002-08-08" PN="CN20020128286" (B211EP)

DATE="2002-04-12" PN="KR2002020134" (B311EP)

EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="G06F1/16"

CI="G06F1/16"

AI="G06F1/16"

TI="Portable computer"

Applicant="SAMSUNG ELECTRONICS CO LTD (KR)" (B711EP)

Inventor="PIL-GYO CHOE (KR)" (B721EP)

Family Member: PN="CN1452040A" PD="2003-10-29" AP="CN02128286A" PN_E="CN1452040"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

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Filed DATE="2002-08-08" PN="CN20020128286" (B211EP)

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EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="G06F1/16"

CI="G06F1/16"

AI="G06F1/16"

TI="Portable computer"

Applicant="SAMSUNG ELECTRONICS CO LTD (KR)" (B711EP)

Inventor="PIL-GYO CHOE (KR)" (B721EP)

Family Member: PN="JP2003316474A" PD="2003-11-07" AP="JP2002250733A"

PN_E="JP2003316474"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-11-07" PN="JP2003316474" (B111EP)

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EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="G06F1/16; G09F9/00"

CI="G06F1/16"

AI="G06F1/16"

TI="PORTABLE COMPUTER"

=PROBLEM TO BE SOLVED: To provide a portable computer having an LCD assembly which is easy to assemble and treat a cable with a simple structure and capable of tilting and swiveling relative to a main body." (B570EP)

="SOLUTION: A hinge part 40, comprising a hollow swiveling part 40b, supported

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on a hollow rotating support part 50 which is provided on the main body 10, capable of swiveling and extended to the direction of the main body 10; and a pair of tilting parts 40a extending outward each in the opposit radial direction of the swiveling part 40b to connect the LCD assembly 20 with capability of tilting, is provided to form the tilting part and the swiveling part integrally. An image signal transmission member 30 is connected from the main body 10 to the LCD assembly 20 through the inside of the swiveling part 40b and the rotating support part 50."

(B570EP)

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Applicant= "SAMSUNG ELECTRONICS CO LTD" (B711EP)

Inventor= "SAI HITSUKEI" (B721EP)

Family Member: PN="KR2003081761A" PD="2003-10-22" AP="KR2002020134A"
PN_E="KR2003081761"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-10-22" PN="KR2003081761" (B111EP)

Filed DATE="2002-04-12" PN="KR2002020134" (B211EP)

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IPC="G06F1/16"

CI="G06F1/16"

AI="G06F1/16"

TI="PORTABLE COMPUTER"

Applicant= "SAMSUNG ELECTRONICS CO LTD (KR)" (B711EP)

Inventor= "CHOI PIL GYU (KR)" (B721EP)

Family Member: PN="US6867961B2" PD="2005-03-15" AP="US20909802A" PN_E="US6867961"

Legal Status: CODE="AS" DESC="ASSIGNMENT" INFL="" DATE_MIGR="0001-01-01"

"US20909802A 2002-08-01AS ASSIGNMENT Owner Name SAMSUNG ELECTRONICS CO., LTD. 416 MAETAN-3DONG, PA"

"US20909802A 2002-08-01AS ASSIGNMENT Free Format Text ASSIGNMENT OF ASSIGNEES INTEREST;ASSIGNOR:CHOI, PHIL-KYU /AR;REEL/FRAME:013164/0063"

"US20909802A 2002-08-01AS ASSIGNMENT Effective DATE 20020724"

Country Code="US"

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Document Number="20909802"

Kind Code="A"

IPR Type="PI"

PRS DOCUMENT TYPE="P"

Gazette DATE="2002-08-01"

Legal Event Code 1="AS"

DATE last exchanged="2005-12-08"

DATE first created="2005-12-05"

Owner Name="SAMSUNG ELECTRONICS CO., LTD. 416 MAETAN-3DONG, PA"

Free Format Text="ASSIGNMENT OF ASSIGNEES INTEREST;ASSIGNOR:CHOI, PHIL-KYU /AR;REEL/FRAME:013164/0063"

Effective DATE="20020724"

Legal Status: CODE="CC" DESC="CERTIFICATE OF CORRECTION" INFL="" DATE_MIGR="0001-01-01"

"US20909802A 2006-01-10CC CERTIFICATE OF CORRECTION"

Country Code="US"

Filing / Published Document="F"

Document Number="20909802"

Kind Code="A"

IPR Type="PI"

PRS DOCUMENT TYPE="P"

Gazette DATE="2006-01-10"

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DATE last exchanged="2006-02-02"

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Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-10-16" PN="US2003193773" (B111EP)

Filed DATE="2002-08-01" PN="US20020209098" (B211EP)

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DATE="2002-04-12" PN="KR20020020134" (B311EP)

EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="H05K5/00"

CI="G06F1/16"

AI="G06F1/16"

TI="Portable computer"

= "A portable computer having a main body generating a video signal, and an LCD assembly receiving the video signal from the main body and displaying a picture. The computer further having a hinge part including a hollow swiveling part extending toward the main body, and a pair of tilting parts radially extended from the swiveling part and rotatably connecting the LCD assembly and the main body; a rotation supporting part provided on the main body and rotatably supporting the swiveling part of the hinge part; and a video signal transmission member having a first end connected to the main body and a second end connected to the LCD assembly while being accommodated inside of the swiveling part of the hinge part and the rotation supporting part, and transmitting the video signal from the main body to the LCD assembly." (B570EP)

= "With this configuration, the portable computer is capable of tilting and swiveling an LCD assembly, has a simple tilting and swiveling structure because of hollow tilting and swiveling parts formed as a single body, has a compact cable accommodating structure, and is capable of firmly keeping the LCD assembly at a desired angle." (B570EP)

Inventor="CHOI PHIL-KYU (KR)" (B721EP)

Family Member: PN="US2003193773A1" PD="2003-10-16" AP="US20909802A"

PN_E="US2003193773"

Legal Status: CODE="AS" DESC="ASSIGNMENT" INFL="" DATE_MIGR="0001-01-01"

"US20909802A 2002-08-01AS ASSIGNMENT Owner Name SAMSUNG ELECTRONICS CO., LTD. 416 MAETAN-3DONG, PA"

"US20909802A 2002-08-01AS ASSIGNMENT Free Format Text ASSIGNMENT OF ASSIGNEES INTEREST;ASSIGNOR:CHOI, PHIL-KYU /AR;REEL/FRAME:013164/0063"

"US20909802A 2002-08-01AS ASSIGNMENT Effective DATE 20020724"

Country Code="US"

Filing / Published Document="F"

Document Number="20909802"

Kind Code="A"

IPR Type="PI"

PRS DOCUMENT TYPE="P"

Gazette DATE="2002-08-01"

Legal Event Code 1="AS"

DATE last exchanged="2005-12-08"

DATE first created="2005-12-05"

Owner Name="SAMSUNG ELECTRONICS CO., LTD. 416 MAETAN-3DONG, PA"

Free Format Text="ASSIGNMENT OF ASSIGNEES INTEREST;ASSIGNOR:CHOI, PHIL-KYU /AR;REEL/FRAME:013164/0063"

Effective DATE="20020724"

Legal Status: CODE="CC" DESC="CERTIFICATE OF CORRECTION" INFL="" DATE_MIGR="0001-01-01"

"US20909802A 2006-01-10CC CERTIFICATE OF CORRECTION"

Country Code="US"

Filing / Published Document="F"

Document Number="20909802"

Kind Code="A"

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PRS DOCUMENT TYPE="P"

Gazette DATE="2006-01-10"

Legal Event Code 1="CC"

DATE last exchanged="2006-02-02"

DATE first created="2006-02-02"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-10-16" PN="US2003193773" (B111EP)

Filed DATE="2002-08-01" PN="US20020209098" (B211EP)

DATE="2002-04-12" PN="KR20020020134" (B311EP)

CN1452040A.txt

EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="H05K5/00"

CI="G06F1/16"

AI="G06F1/16"

TI="Portable computer"

= "A portable computer having a main body generating a video signal, and an LCD assembly receiving the video signal from the main body and displaying a picture. The computer further having a hinge part including a hollow swiveling part extending toward the main body, and a pair of tilting parts radially extended from the swiveling part and rotatably connecting the LCD assembly and the main body; a rotation supporting part provided on the main body and rotatably supporting the swiveling part of the hinge part; and a video signal transmission member having a first end connected to the main body and a second end connected to the LCD assembly while being accommodated inside of the swiveling part of the hinge part and the rotation supporting part, and transmitting the video signal from the main body to the LCD assembly." (B570EP)

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Inventor="CHOI PHIL-KYU (KR)" (B721EP)

#OPS Legal Status:

Family Member: PN="CN1452040A" PD="2003-10-29" AP="CN02128286A" PN_E="CN1452040"

Priority: PRIO="KR2002020134A" DATE="2002-04-12"

Published DATE="2003-10-29" PN="CN1452040" (B111EP)

Filed DATE="2002-08-08" PN="CN20020128286" (B211EP)

DATE="2002-04-12" PN="KR20020020134" (B311EP)

EPC="G06F1/16P2H; G06F1/16P2S3"

IPC="G06F1/16"

CI="G06F1/16"

AI="G06F1/16"

TI="Portable computer"

Applicant="SAMSUNG ELECTRONICS CO LTD (KR)" (B711EP)

Inventor="PIL-GYO CHOE (KR)" (B721EP)

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